C1041

May 1998 CALFED ECOSYSTEM RESTORATION
PROPOSAL SOLICITATION

WATER QUALITY AND VEGETATION AND BIOMASS STUDIES FOR THE DECKER ISLAND TIDAL WETLAND ENHANCEMENT PROJECT
July 2, 1998

Applicant Name: Department of Water Resources, Division of Planning and Local Assistance, Municipal Water Quality Investigations Program

Mailing Address: 1020 Ninth Street, 3rd Floor
Sacramento, CA 95814-3515

Telephone: (916) 327-1725

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Amount of funding requested: **$389,400 over 3 years**

Proposal Topic:

___ Fish Passage Assessment
___ Fish Passage Improvements
_X_ Floodplain and Habitat Restoration
___ Gravel Restoration
___ Fish Harvest
___ Species Life History Studies
___ Watershed Planning/Implementation
___ Education
___ Fish Screen Evaluations - Alternatives and Biological Priorities

Geographic Area of Proposal:

___ Sacramento River Mainstem
_X_ Delta
___ Suisun Marsh and Bay
___ Landscape (entire Bay-Delta watershed)
___ San Joaquin River Mainstem
___ Sacramento Tributary:_____
___ East Side Delta Tributary:_____
___ San Joaquin Tributary: _____

___ Other: _____
___ North Bay: _____

Primary Species the Proposal Addresses:

___ San Joaquin and East-side Delta tributaries fall-run chinook salmon
_X_ Winter-run chinook salmon
___ Spring-run chinook salmon
___ Late-fall run chinook salmon
___ Fall-run chinook salmon
_X_ Delta smelt
___ Longfin smelt
___ Splittail
___ Steelhead trout
___ Green sturgeon
___ Striped bass
___ Migratory birds

Type of applicant:

_X_ State agency
___ Federal agency
___ Public/Non-profit joint venture
___ Non-profit
___ Local government/district
___ Private party
___ University
___ Other:

Type of project:

___ Planning
___ Implementation
_X_ Monitoring
___ Education
___ Research

By signing below, the applicant declares the following:

(1) the truthfulness of all representations in their proposal;

(2) the individual signing the form is entitled to submit the application on behalf of the applicant (if applicant is an entity or organization); and

(3) the person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section II.K) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

DJ Otis for

Richard Breuer
Chief, Department of Water Resources, Division of Planning and Local Assistance, Municipal Water Quality Investigations Program

II. Executive Summary

a. Project Title: Water Quality and Vegetation and Biomass Studies for the Decker Island Tidal Wetland Enhancement Project

b. Project Applicants: Department of Water Resources, Division of Planning and Local Assistance, Municipal Water Quality Investigations Program (MWQI), and Department of Water Resources, Environmental Services Office (ESO)

c. Project Description and Primary Biological/Ecological Objectives: The proposed project is a three-year water quality and vegetation study of a tidal wetland restoration project in the western Sacramento-San Joaquin Delta. The Decker Island Restoration Project is an existing Category III funded effort to restore 70 acres of tidally influenced shallow water habitat for aquatic species of concern. The Port of Sacramento and a private consulting firm, Surface Water Resources Incorporated, are the current project proponents. Their existing Category III funding is limited to breaching a portion of the existing levee, restoration of the tidal hydrology, and examination of three target fish species: Chinook salmon, Delta smelt, and Sacramento splittail, and their use of the habitat. This proposal expands the project to include vegetation monitoring, assessment of productivity, habitat classification, and flow and water quality studies.

d. Approach/Tasks/Schedule: The approach for the proposed project will be to monitor vegetation and biomass, water quality, and hydrology at the restored tidal habitat, evaluate their relationships, and identify ecosystem linkage regarding potential impacts on drinking water quality associated with production of organic carbon by the habitat aquatic foodweb. The proposed project will provide valuable information to assist with the design of future wetlands envisioned in the CALFED Bay-Delta Ecosystem Restoration Program Plan. The project includes five tasks: study design, coordination, and management, flow and water quality monitoring, soils and vegetation monitoring, data analysis and report preparation, and meeting attendance . The start date for the project is tentatively set for fall 1998, in conjunction with the Port of Sacramento and Surface Water Resources Incorporated, and will last until approximately 2001. The existing project, primarily water quality and fish habitat use monitoring, will last for five years or to approximately 2003.

e. Justification for Project and Funding by CALFED: Restoring tidal perennial aquatic habitat will have substantial benefits for the target fish species by providing valuable spawning, rearing, and foraging areas for these species. Decker Island, located in the West Delta ecological zone, was created by construction of the Sacramento Deep Water Ship Channel. Given the scarcity and value of tidal perennial habitat in the Bay-Delta and the need for additional data about the structure and function of newly restored areas, this project is consistent with the vision for the CALFED Bay-Delta Ecosystem Restoration Program Plan.

f. Budget Costs and Third Party Impacts: The total budget requested for the proposed project over three years is $389,400, which is broken down as follows:

Year 1 - $146,800
Year 2 - $121,300
Year 3 - $121,300

Cost sharing is a significant feature of this proposal because DWR would contribute over half of the total costs of the project in each of the three years. Annual costs for each of the three years are presented in Tables 1 and 2 of this proposal. There are no known or identified third party impacts associated with the proposed project.

g. Applicant Qualifications: The proposed project will include four key staff from the two DWR offices. All staff have substantial experience in their respective resource areas as well as relevant experience working in the Bay-Delta. Individual staff and their roles are:

1. Richard Breuer - Chief, MWQI. Responsible for supervising and managing program resources and MWQI Unit staff coordination with the MWQI Committee and stakeholders.

2. Michael Zanoli - Project Manager, MWQI. Responsible for overall project management and coordination with collaborators and original project participants, day-to-day activities and technical oversight, and budget and schedule.

3. David Gonzalez - Chief, Field Group, MWQI. Responsible for managing the field unit staff, equipment, and logistics for field work, sample collection, and coordination with ESO staff.

4. Jean Witzman - Environmental Specialist, Environmental Services Office. Task Leader for Vegetation and Biological Monitoring and Assessment.

h. Monitoring and Data Evaluation: The proposed project as implemented will be a monitoring and data evaluation project. Data evaluation is described in detail in Section IV-b, Task 4.

i. Local Support/Coordination with Other Programs and Compatibility with CALFED Objectives: The project has widespread support and there are no conflicts with local interests. Restoration of this habitat type on Decker Island is consistent with the vision for the West Delta ecological zone and is compatible with all applicable CALFED implementation objectives for priority habitat, species, and the aquatic foodweb, and is discussed in more detail in Section IV-e of this proposal.

III. Title Page

WATER QUALITY AND VEGETATION AND BIOMASS STUDIES FOR THE DECKER ISLAND TIDAL WETLAND ENHANCEMENT PROJECT

a. Name of Applicants

Department of Water Resources, Division of Planning and Local Assistance, Municipal Water Quality Investigations Program, and
Department of Water Resources, Environmental Services Office

b. Principal Investigators

Richard Breuer, Division of Planning and Local Assistance, Municipal Water Quality Investigations Program
1020 Ninth Street, 3rd Floor, Sacramento, CA 95814-3515
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3251 S Street, Sacramento, CA 95816-7017
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fax: (916) 227-7554
email: jwitzman@water.ca.gov

c. Type of Organization and Tax Status

State Agency

d. Tax Identification Number

Not Applicable

e. Participants/Collaborators in Implementation

See applicant and principal investigators above

IV. Project Description

a. Project Description and Approach

The proposed project is a three-year water quality and vegetation study of a tidal wetland restoration project in the western Sacramento-San Joaquin Delta. The Decker Island Restoration Project is an existing Category III funded effort to restore 70 acres of tidally influenced shallow water habitat for aquatic species of concern. The Port of Sacramento and a private consulting firm, Surface Water Resources Incorporated (SWRI), are the current project proponents. Their existing Category III funding is limited to breaching a portion of the existing levee, restoration of the tidal hydrology, and examination of three fish species: Chinook salmon, Delta smelt, and Sacramento splittail, and their use of the habitat. This proposal expands the project to include vegetation monitoring, assessments of primary productivity, habitat classification, and flow and water quality monitoring. The project is being called a tidal wetland enhancement pilot project but it will restore tidal perennial aquatic habitat, as described in the CALFED Bay-Delta Ecosystem Restoration Program Plan (ERPP).

The proponents for this project will be a collaboration of DWR's Environmental Services Office (ESO) and the Municipal Water Quality Investigations Program (MWQI). The approach for the proposed project will be to monitor vegetation and biomass, water quality, and hydrology in the restored tidal habitat, evaluate potential relationships, and identify ecosystem linkage regarding potential impacts on drinking water quality associated with production of organic carbon by the habitat aquatic foodweb. The proposed project would provide valuable information that would assist with the design of future wetlands as envisioned in the CALFED ERPP to maximize habitat benefits and reduce any potential impacts on water quality.

b. Proposed Scope of Work

The proposed scope of work consists of the following five tasks:

1. Study Design, Coordination, and Management

This task will include internal meetings and coordination with task leaders, laboratory, and field staff to refine study design and other monitoring requirements. Existing technical information in the form of progress reports, research papers, research questions, and other relevant documents will be reviewed to become fully apprised of the study of shallow water habitat. Contacts will be made as necessary to share information and collaborate on refining the design of the monitoring plan for the proposed project. A Quality Assurance Project Plan (QAPP) will be prepared for the proposed project according to the guidance and general requirements of DWRs "Quality Assurance Management Plan for Environmental Monitoring Programs" (Quality Assurance Technical Document 5, draft December 1997). Adherence to the requirements of this document will ensure that environmental data collected are of appropriate

type and quality for their intended use, and that environmental monitoring and analysis is designed and conducted according to approved specifications and protocols.

2. Conduct Flow and Water Quality Monitoring

The role of organic carbon in the estuary is not fully understood and the potential exists for the thousands of acres of tidal perennial aquatic habitat proposed in the ERPP to generate large quantities of organic carbon. Organic carbon is a precursor to harmful disinfection byproducts (DPB's) in water treatment plants. Activities in this task will include monitoring of tidal flows in the levee breach, and collection of water quality samples in the breach and the interior of the island. Monitoring both tidal flow and water quality will be performed using a floating platform anchored inside the levee breach. The floating platform will be anchored so it moves up and down with the tidal stage with the appropriate equipment located inside a security cabinet and readily accessible from the Horseshoe Bend channel by small boat. Flow monitoring will be accomplished by installing a tidal stage recorder and data logger inside the breach, continuously measuring the tidal stage, and computing the flow volume in and out of the breach based on a pre-determined relationship between stage and the flooded surface area inside the island. The relationship between stage and flooded surface area will be determined based on detailed topographic surveys of the tidal wetland area. Water quality monitoring will be focused on evaluating organic carbon and DBP generation and its correlation with the development and quality of tidal aquatic habitat.

Sample Collection, Frequency, and Parameters

One of the main objectives of the project is to sample tidal flow in and out of the island to estimate the net difference in mass carbon load. It is vitally important that samples be collected during appropriate tidal cycles, over representative time periods within each cycle, and during the appropriate seasonal periods. Sampling will include both grab and periodic sampling using autosamplers. The proposed sampling cycle will capture the full circulation and flushing of the island over the diurnal tidal cycle on two consecutive days (e.g., two flood and two ebb tides per sampling period). Three tidal cycles in each season representing a high, low, and mid-range tides will be sampled during each period to represent the maximum range of the tidal prism. Samples will also be collected at 4 locations from the interior of the island and will be correlated with habitat type and productivity. Actual sampling locations will be established prior to beginning the study. Sample collection and frequency will be monitored and adjusted as necessary using an adaptive management approach. For example, sampling during wet weather periods and high river flows may be reduced if stable trends in water quality are observed.

Both grab and autosampler samples will be collected and analyzed for the following water quality parameters:

- pH, dissolved oxygen, electrical conductivity, temperature (grab samples only),
- turbidity,

- total organic carbon (TOC), dissolved organic carbon (DOC), ultraviolet absorbance (UVA),
- reactivity-based trihalomethane formation potential (THMFP) and haloacetic acid formation potential (HAAFP),
- ammonia,
- total dissolved solids,
- bromide, chloride, and
- chlorophyll *a*, fluorescence (to monitor algal productivity).

Refer to Section V for a detailed description of the parameters to be analyzed and the estimated sampling costs.

Circulation Study

A circulation study will be conducted to evaluate the circulation patterns inside the island and the potential effects on water and habitat quality. Data obtained from this study will be analyzed with water quality data collected from the interior of the flooded island. The study will be conducted during average dry-season flow conditions (e.g., May-October). It is assumed that circulation will be adequate during wet weather and higher sustained flows on the Sacramento and San Joaquin Rivers. A simple approach will be used placing numbered drogues made of natural material in the interior of the island.

3. Conduct Soils and Vegetation Monitoring

Wetland vegetation community development is based on the interrelationship between elevation, hydrology, local seed source, and plantings. The biomass produced by various vegetation communities has the potential to contribute to the organic carbon in the surrounding water body. The primary objectives of this task are to: 1) characterize the vegetation communities developing in the restored wetland; 2) quantify the biomass produced in the developing wetland; and 3) correlate biomass production with organic carbon data from water quality studies. A reconnaissance evaluation of vegetation will be performed to adapt methods to fit the conditions that develop at the site after project construction. The number of transects and the timing of sampling needed to determine plant community types and associated biomass will vary depending on the complexity of the developing wetland. Soil and vegetation conditions on the island prior to flooding the island will be determined to establish background soil and vegetation conditions. Exact locations and numbers of pre-flood samples will be determined based on field conditions prior to the breach.

Following the levee breach, vegetation monitoring will include two data acquisition methods:

a. Quantify and qualify plant communities at the site over time. Color aerial photography will be taken (1:24,000 scale) during a summer low tide cycle. Analysis of aerial

photos will identify changes in hydrology, vegetation, and other habitat characteristics and provide additional information about the biological linkage between each element. Plant communities will be predelineated on the photos; delineation lines will be ground-truthed and adjusted. Stratified random transects within each community type will be identified. Samples will be collected to determine plant composition and percent cover to describe each community. Acreage of community types will be measured and a vegetation map will be produced. Sampling will be repeated each year at the same time of year and tidal cycle for three consecutive years.

b. Determine biomass production in each wetland plant community. A nondestructive sampling method will be used to determine biomass produced in the project area. Vegetation will be sampled in plots at a reference site (outside of study area) to collect data on plant height and density. Vegetation in the reference plots will be harvested and dry weight determined. A regression line will be developed to relate plant size and biomass. Plant size and density data will be collected in the study area and the regression line will be used to determine biomass. Repeat each year; biomass sampling may be conducted more often to determine seasonal changes.

Soil samples from the created channels will be collected prior to the opening of the breach, composited, and analyzed for TOC, DOC, reactivity-based THMFP and HAAFP, ammonia, bromide, and UVA.

4. Data Analysis and Report Preparation

Data will be analyzed to determine general conditions and water quality, vegetation, and habitat conditions before and after breaching the levee, and over the three-year project period. The focus of data analysis will be to identify, if possible, the key factors in the development of the habitat that affect fish habitation and any potential effects on water quality. Progress reports summarizing the status of the project to date will be prepared quarterly and submitted to CALFED and other interested parties. Formal reports will be prepared annually in both draft and final versions, as well as a final report after project completion.

5. Attend Meetings

This task will include attendance at periodic meetings with the original project proponents, the Port of Sacramento and SWRI, project management meetings with ESO and MWQI key staff, and presentations to CALFED to report on the progress and utility of the projects and share information among other CALFED contract recipients.

c. Location and/or Geographic Boundaries of the Project

Decker Island is located in the Sacramento-San Joaquin Delta Ecological Zone, in the western portion of the Central and West Delta Ecological Unit (Figure 1). The island is bounded on the east by Horseshoe Bend and Sherman Island, and along the north, south, and west by the

Sacramento River. The proposed project is located on the southeastern-most tip of Decker Island (Figure 2).

d. Expected Benefits

The proposed project will provide several distinct benefits over the existing Category III funded project. The existing project includes important basic restoration elements for the target fish species and habitat type but other important elements included in this proposal are not addressed. The task elements in this proposal link the existing fish use and habitat evaluation work, and expand the biological assessment work in several key areas to evaluate relationships to water quality. The proposed project would provide valuable information for the design of future habitats on a large scale in the Bay-Delta as proposed in the CALFED ERPP. This information is needed to maximize the potential ecological benefits of future habitats and minimize their potential impacts on water quality.

The target habitat is tidal perennial aquatic habitat and the primary benefit of the proposed project will be to increase shallow-water and intertidal mudflat habitat, provide rearing and foraging habitat, and escape cover for three priority fish species. The priority species for the proposed project are winter and spring-run Chinook salmon, Delta smelt, and Sacramento splittail. The primary stressors are floodplain and marshplain management, channel form changes, and water quality. Secondary benefits include creation of habitat for other valuable aquatic and terrestrial species, limited recreation, reduction of agricultural runoff, and sediment reduction. Potential benefits to third parties, such as Bay-Delta water utilities and SWP contractors, include improved water quality and reduced costs of treatment to comply with drinking water regulations.

e. Background and Ecological/Biological/Technical Justification

The substantial loss of historic shallow tidal waters, primarily as a result of reclamation and channel dredging and scouring, has led to the decline of many native fish, wildlife, and plant species in the Bay-Delta. Restoring this habitat will provide substantial benefits for many fish and wildlife species. In particular, chinook salmon, Delta smelt, and Sacramento splittail by providing valuable spawning, rearing, and foraging areas for these species. Decker Island, located in the West Delta ecological zone, was created by construction of the Sacramento Deep Water Channel. Given the scarcity and value of tidal perennial habitat in the Bay-Delta and the need for additional data about the structure and function of newly restored areas, restoration of this habitat on Decker Island is consistent with the ERPP vision for the West Delta ecological zone. The results of the project will provide valuable insight about the feasibility and design of future projects to meet the CALFED target of restoring 7,000 acres of this habitat in the Sacramento-San Joaquin Delta. A similar approach to the proposed project is being taken on a restoration project for over 1,300 acres at Prospect Island that was degraded by the deep water ship channel and other flood control projects.

The topic from the PSP for the project is "Floodplain Management and Habitat Restoration" (Topic C). The ERPP implementation objective for the target habitat is to increase shallow-water and intertidal mudflat habitat to improve conditions that support increased primary and secondary productivity; provide rearing and foraging habitat, and escape cover for fish; and provide foraging and resting habitat, and escape cover for water birds (ERPP Vol. I, Table 5, p74, 82). The proposed project will also support the implementation objective for the ecological process "Bay-Delta Foodweb", as stated in Vol. I, Table 2, p17. The priority species for the proposed project are winter and spring-run Chinook salmon, Delta smelt, and Sacramento splittail. The descriptions and implementation objectives for these priority species were taken from Vol. I, Table 8, p122. The primary stressors addressed by the proposed project, floodplain and marshplain management, channel form changes, and water quality, were identified in Attachment C of the PSP. The proposed project will also meet the general objectives of the federal Anadromous Fish Restoration Program (AFRP) such as improving physical habitat for all life stages of anadromous fish, collecting data on habitat to evaluate restoration actions, and involving partners in the implementation and evaluation of restoration actions.

f. Monitoring and Data Evaluation

The proposed project as implemented will be a monitoring and data evaluation project. The nature and extent of monitoring and data evaluation are described in the tasks above. Coordination with other programs and peer review in the monitoring and data evaluation process are also described above in Section IV-b, Task 1, and Section IV-e. Data evaluation is described in detail in Section IV-b, Task 4.

g. Implementability

The monitoring and assessment project in this proposal is contingent upon the successful execution of the basic restoration activities (e.g., grading, planting, levee breach) in the existing Category III project. SWRI and the Port of Sacramento, the existing project proponents, will satisfy all legal requirements for construction and breaching of the levee. An initial study/negative declaration has already been prepared and approved to comply with NEPA/CEQA requirements, and the proposed project will not change the conclusion of the initial study or adversely affect the environment. The project has wide-spread support and there are no conflicts with local interests. An important part of this proposal is the MWQI cost sharing portion of the water quality monitoring, which has been reviewed and approved by the MWQI Committee. This is an advisory committee comprised of representatives from the EPA, the State Water Resources Control Board, Department of Health Services, and water quality experts from utilities such as Contra Costa Water District and Metropolitan Water District of Southern California. MWQI intends to conduct some level of flow and water quality monitoring regardless of the outcome of the proposal process, but the requested funding will provide the valuable biological assessment linkage and will further support the ERPP goals and objectives.

V. Costs and Schedule to Implement Project

The costs for the first year of the three-year project are broken down by task and subtask in Table 1. The table shows total project expense, DWR cost share, and the net requested funds. The cost share is a significant feature of this proposal because DWR is contributing over half of the total costs of the project in each of the three years. Annual costs for the second and third years, respectively, are presented in Table 2. A detailed cost breakdown for the water quality and soil analyses is presented in Table 3. The requested funds for the project are:

Year 1 - $146,800
Year 2 - $121,300
Year 3 - $121,300

The total budget requested for the proposed project is $389,400.

For the second and third years, the annual costs decrease because study design will be completed, no additional equipment will be purchased, background soil sampling will not be performed, and MWQI staff costs will decrease slightly. There are no subcontractors, funding partnerships, or other financial commitments for the proposed project.

The start date for the project is tentatively set for fall 1998, in conjunction with activities of the Port of Sacramento and SWRI. MWQI will begin the soil and water quality studies at this time using its intended cost share. The original project, which is primarily water quality and fish use studies, will last for five years or until approximately 2003. The project elements requested for funding in this proposal will last until approximately 2001. There are no known or identified third party impacts associated with the proposed project.

VI. Applicant Qualifications

Staff Organization, Roles, and Responsibilities

DWR - Municipal Water Quality Investigations Program Staff

1. Richard Breuer - Chief, MWQI

Responsible for supervising and managing program resources and MWQI Unit staff coordination with the MWQI Committee and stakeholders.

Expertise and Experience: Agronomy, Integrated Pest Management, Agricultural Chemical Fate in the Environment, GIS, GPS, CEQA/NEPA, FESA, CESA, Terrestrial Biology, Drinking Water Quality Issues and Research. Relevant project experience includes Reduction of Rice Herbicide in the Sacramento River Program (Department of Food and Agriculture/DPR), Land Management and Habitat Planning for Twitchell and Sherman Islands in the Western Sacramento-San Joaquin Delta (DWR), and Impact Evaluation and Mitigation Measures Development for the Interim South Delta Project (DWR).

Education: M.S., Plant Protection and Pest Management, University of California, Davis; B.S., Agronomy, California State University, Chico.

2. Michael Zanoli - Project Manager, Decker Island Water Quality and Vegetation Study

Responsible for overall project management and coordination with collaborators and original project participants, day-to-day activities and technical oversight, and budget and schedule.

Expertise and Experience: Sampling program design, wastewater and stormwater discharge evaluation, trace metal contamination, data analysis and report writing. Relevant experience includes Mono Basin water quality studies, reconnaissance water quality investigation of Little Holland Tract, and developed a 5-year monitoring program for a constructed wetland project that included sampling water, sediment, and tissues of plants, invertebrates, and fish.

Education: M.S., Environmental Management, University of San Francisco; B.S., Biological Science, California State Polytechnic University, San Luis Obispo.

3. David Gonzalez - Chief, Technical Services Section Field Group

Responsible for managing the field unit staff, equipment, and logistics for field work to collect water quality and hydrological samples and data, and coordination with ESO field staff.

Expertise and Experience: Management of environmental field monitoring programs, Delta water quality monitoring, analytical laboratory methods, and QA/QC procedures.

Education: B.S., Biology, Eastern Michigan University; B.A., Environmental Studies and Planning, Sonoma State University.

DWR - Environmental Services Office Staff

1. Jean Witzman - ESO, Task Leader for Vegetation and Biological Monitoring and Assessment

Experience: Ms. Witzman has over 10 years as a professional botanist. Her experience includes vegetation mapping, sensitive plant surveys, collection of ecological data; monitoring species and plant community response to project operations; wetland delineation; and permitting and report writing for environmental compliance. Ms. Witzman's current projects include developing the vegetation monitoring plan for the Prospect Island Restoration Project, vegetation and rare plant monitoring for the South Delta Temporary Barriers Project, and wetland delineation for DWR's Decker Island Habitat Development/Levee Improvement Project (not related to original proponents project).

Education: B.A. Biology, University of Northern Iowa; M.S. Botany, California State University at Chico

Conflict of Interest

There are no known conflicts of interest on the proposed project, nor are there any conflicts with the Port of Sacramento, SWRI, or other agencies and entities.

VII. Compliance with Standard Terms and Conditions

The standard terms and conditions for the proposed project are those listed in Item 3 of Attachment D of the PSP and are applicable to the selected topic C, "Floodplain Management and Habitat Restoration", to be funded from State funds and implemented by an interagency agreement between DWR and the Resources Agency.

The standard clauses for Interagency Agreements are:

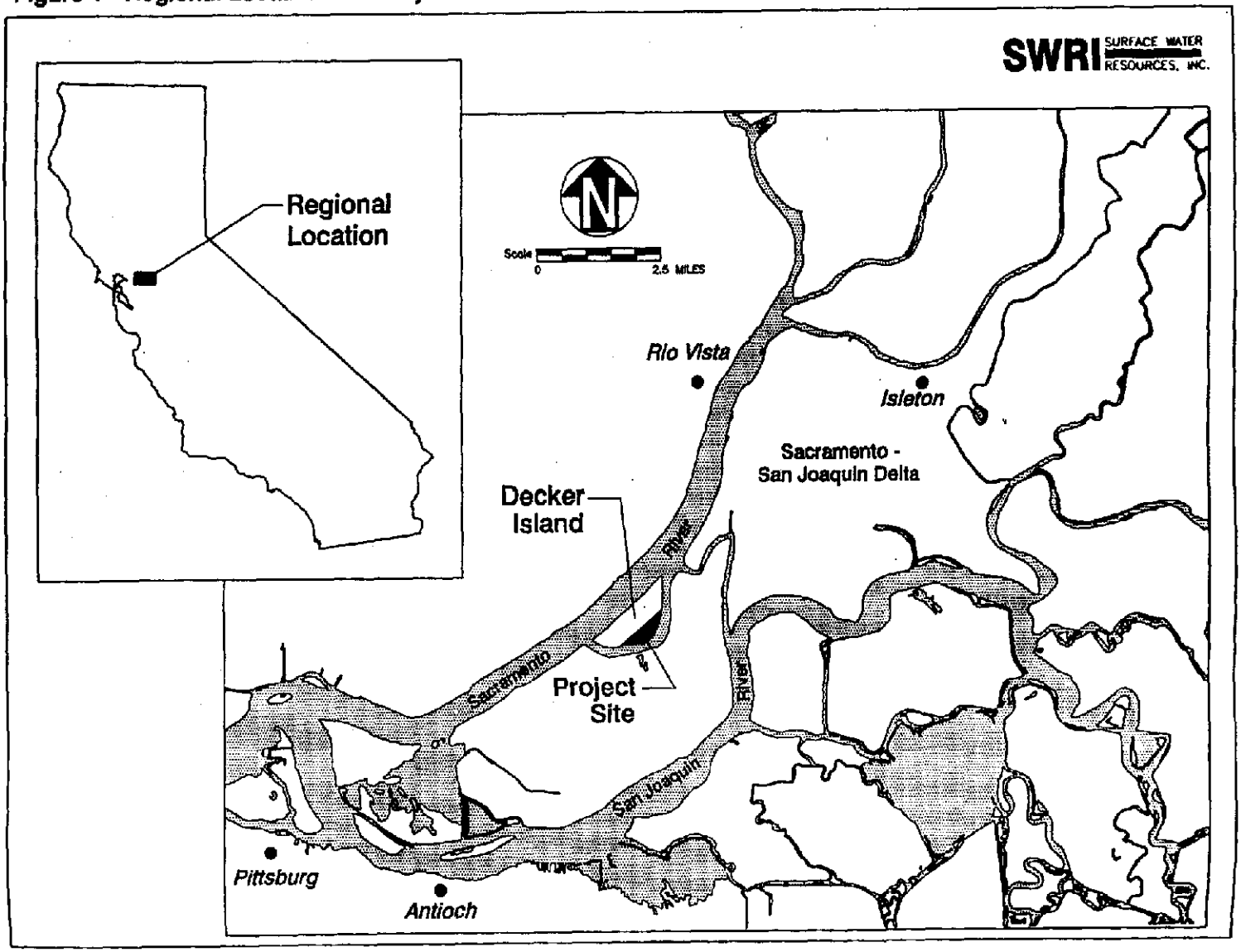
Audit Clause. For contracts in excess of $10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546.7).

Availability of Funds. Work to be performed under this contract is subject to availability of Category III funds through the State's normal budget process.

Interagency Payment Clause. For services provided under this agreement, charges will be computed in accordance with State Administrative Manual Section 8752.

Termination Clause. Either State agency may terminate this contract upon 30 days advance written notice. The State agency providing the services shall be reimbursed for all reasonable expenses incurred up to the date of termination.

Figure 1 - Regional Location and Project Area



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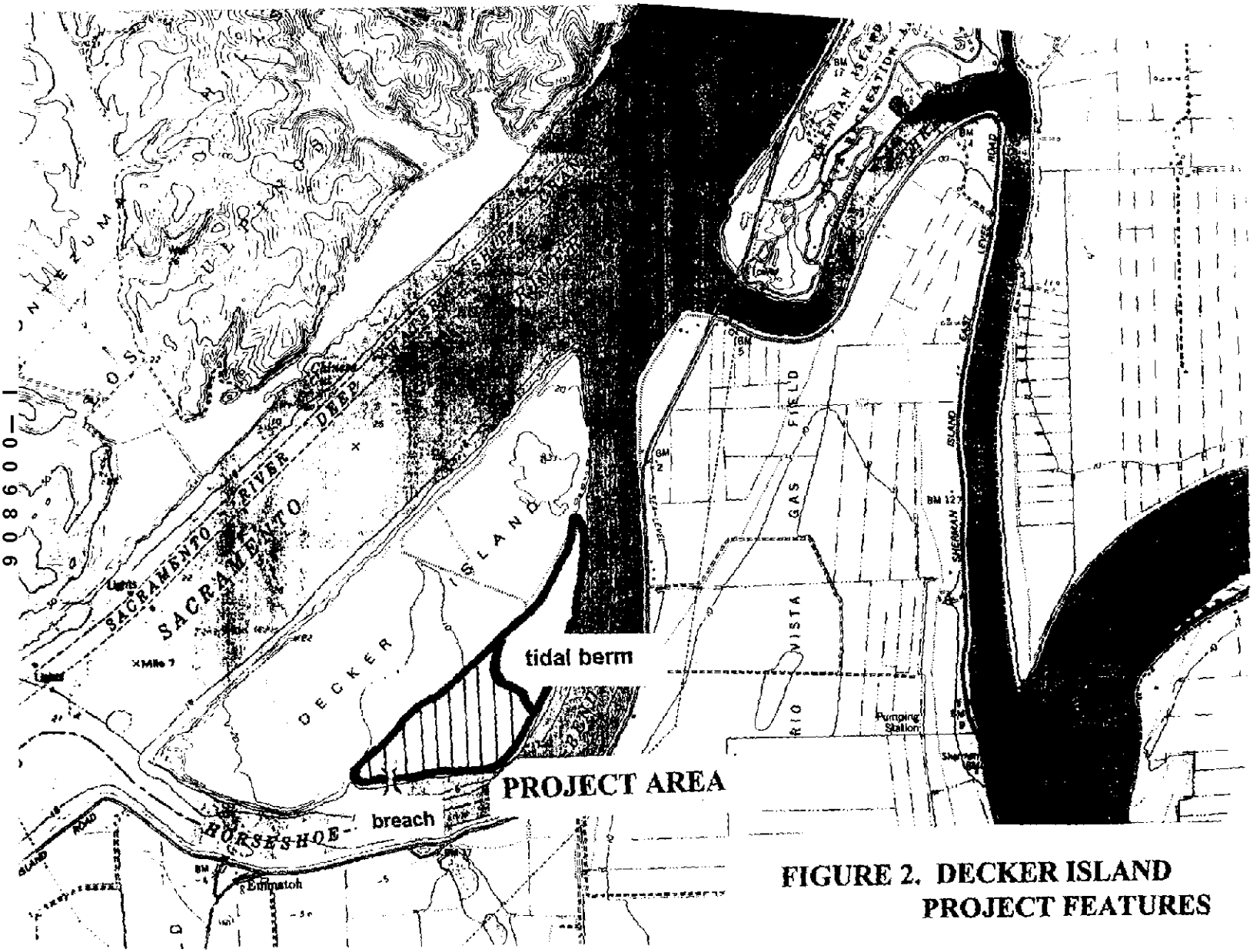

FIGURE 2. DECKER ISLAND PROJECT FEATURES

Table 1. First Year Decker Island Cost Breakdown

Tasks	MWQI Staff Costs	ESO Staff Costs	Equipment & Materials	Operations & Maintenance	Lab Analysis	Total Expense	DWR (MWQI) Cost Share	Requested Funds
1. Study design, Coordination, Management	$55,000	$5,000	0	0	0	$60,000	$40,000	$20,000
2. Water Quality, Flow Monitoring								
A. Flow monitoring and Sample collection	$38,000	0	$23,000[a]	$12,000[b]	$113,000[c]	$186,000	$120,000	$66,000
B. Circulation Study	$4,500	0	$1,000	0	0	$5,500	$4,000	$1,500
3. Soil, Vegetation Monitoring								
A. Soil	$4,000	0	$2,000	0	$4,000[c]	$10,000	$8,000	$2,000
B. Vegetation Monitoring								
1) Aerial photos	0	$4,000	$1,500	0	0	$5,500	0	$5,500
2) Plant communities	0	$6,200	$1,100	0	0	$7,300	0	$7,300
3) Plant biomass	0	$10,000	$3,500	0	$4,000	$17,500	0	$17,500
4. Data Analysis, Report Preparation	$40,000	$10,000	0	0	0	$50,000	$25,000	$25,000
5. Attend Meetings	$2,500	$2,500	0	0	0	$5,000	$3,000	$2,000
Total						**$346,800**	**$200,000**	**$146,800**

[a] Includes floating monitoring platform, materials, topographic survey, and flow measurement equipment.
[b] Includes boat operation costs.
[c] Refer to Table 3.

Table 2. Decker Island Annual Cost Breakdown for Second and Third Year

Tasks	MWQI Staff Costs	ESO Staff Costs	Equipment & Materials	Operations & Maintenance	Lab Analysis	Total Expense	DWR (MWQI) Cost Share	Requested Funds
1. Study design, Coordination, Management	$45,000	$5,000	0	0	0	$50,000	$40,000	$10,000
2. Water Quality, Flow Monitoring								
A. Flow monitoring and Sample collection	$35,000	0	$13,000[a]	$12,000[b]	$113,000[c]	$173,000	$120,000	$53,000
B. Circulation Study	$4,000	0	$1,000	0	0	$5,000	$4,000	$1,000
3. Vegetation Monitoring								
A. Aerial photos	0	$4,000	$1,500	0	0	$5,500	0	$5,500
B. Plant communities	0	$6,200	$1,100	0	0	$7,300	0	$7,300
C. Plant biomass	0	$10,000	$3,500	0	$4,000	$17,500	0	$17,500
4. Data Analysis, Report Preparation	$40,000	$10,000	0	0	0	$50,000	$25,000	$25,000
5. Attend Meetings	$2,500	$2,500	0	0	0	$5,000	$3,000	$2,000
Total						**$313,300**	**$192,000**	**$121,300**

[a] Includes topographic survey.
[b] Includes boat operation costs.
[c] Refer to Table 3.

Table 3. List of Parameters and Costs of Analyses for Water Quality and Soil Monitoring

Parameter	Sample Location	No. of Samples per Event	Sampling Frequency	Total No. of Analyses	Unit Price ($)	Total Cost
Grab Sampling						
pH	BR, INT	6	12	72	--	$0
Dissolved Oxygen	BR, INT	6	12	72	--	$0
Specific Conductance	BR, INT	6	12	72	--	$0
Temperature	BR, INT	6	12	72	--	$0
Turbidity, Hach	BR, INT	6	12	72	10	$720
Total Organic Carbon	INT	4	12	48	40	$1,920
Dissolved Organic Carbon	INT	4	12	48	40	$1,920
Ultraviolet Absorbance	INT	4	12	48	20	$960
Ammonia	INT	4	12	48	15	$720
Total Dissolved Solids	INT	4	12	48	15	$720
Chlorophyll *a*, fluorescence	INT	4	12	48	35	$1,680
Bromide	INT	4	12	48	25	$720
Reactivity-based THMFP and HAAFP	INT	4	12	48	320	$15,360
Field Blanks (Ammonia, Organic Carbon)	INT	2	12	24	55	$1,320
Autosampler Sampling						
Turbidity, Hach	BR	24	12	288	10	$2,880
Total Organic Carbon	BR	24	12	288	40	$11,520
Dissolved Organic Carbon	BR	24	12	288	40	$11,520
Ultraviolet Absorbance	BR	24	12	288	20	$5,760
Ammonia	BR	24	12	288	15	$4,320
Total Dissolved Solids	BR	24	12	288	15	$4,320

Table 3. List of Parameters and Costs of Analyses for Water Quality and Soil Monitoring *(continued)*

Parameter	Sample Location	No. of Samples per Event	Sampling Frequency	Total No. of Analyses	Unit Price ($)	Total Cost
Chlorophyll *a*, fluorescence	BR	24	12	288	35	$10,080
Bromide	BR	24	12	288	25	$7,200
Chloride	BR	24	12	288	15	$4,320
Reactivity-based THMFP and HAAFP	BR	6	12	72	320	$23,040
Field Blanks (Ammonia, Organic Carbon)	BR	2	12	24	55	$1,320
Soil Sampling						
Modified Elutriate Prep.	BR, INT	6	1	6	150	$900
Total Organic Carbon	BR, INT	6	1	6	40	$240
Dissolved Organic Carbon	BR, INT	6	1	6	40	$240
Bromide	BR, INT	6	1	6	25	$150
Ultraviolet Absorbance	BR, INT	6	1	6	20	$120
Reactivity-based THMFP and HAAFP	BR, INT	6	1	6	320	$1,920
Ammonia	BR, INT	6	1	6	15	$90
Field Blanks (Ammonia, Organic Carbon)	INT	2	1	2	55	$110
Elutriate Blanks (Ammonia, Organic Carbon)	INT	2	1	2	55	$110

Total cost for grab samples	$ 26,040
Total cost for autosampler samples	$ 86,280
Grand total for water analysis	$112,320
Total cost for soil sampling	$ 3,880
Grand total for all analyses	$115,980

Notes:
BR = Breach
INT = Island Interior

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